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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/309,894	05/11/1999	HIROAKI TAKEBE	826.1546/JDH	8094

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EXAMINER

DASTOURI, MEHRDAD

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 04/13/2004

33

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/309,894

Applicant(s)

TAKEBE ET AL.

Examiner

Mehrdad Dastouri

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-4 and 6-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6 and 8-14 is/are rejected.
- 7) ☒ Claim(s) 3, 4 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>31</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 5, 2004 has been entered.

Response to Amendment

2. Applicants' amendment filed, February 17, 2004, has been entered and made of record.

3. The first three pages of the Information Disclosure Statement filed on March 5, 2004, are in Japanese language without any corresponding English translation. It appears that these three pages have been cited in a communication from a foreign patent office in a counterpart foreign application. Applicants are respectfully requested to submit an English translation of this information.

4. Applicants' arguments concerning Claims 1 and 9-14 have been fully considered but they are not persuasive. Regarding Claims 1 and 9-14, Applicants argue in essence that prior art of record (Lyon) does not disclose "A feature amount extracted from a word matches a feature amount obtained by combining the respective feature amounts extracted from a plurality of characters composing the word, using the composition operation".

The Examiner disagrees and indicates that Lyon's teachings depicted in Figures 14 and 15 incorporates the same procedure as recited in the instant invention disclosure Pages 28-30 and their associated Figures 14 and 15. The ideograph "Forest" in Figure 14 of the prior art comprises of three "one-character word". The recognition process disclosed by Lyon teaches matching feature amounts of ideograph "Forest" (the word) with a feature amount obtained by combining the respective feature amounts extracted from a plurality of characters composing the word (the feature amount of the characters "Tree" composing the word "Forest"). Furthermore, the instant invention also utilizes the feature amount of characters in the process of target recognition.

The feature amounts of the candidate word recited in the claims are also the feature amounts of a model (prototype or template as depicted in Figure 15, each individual character in dictionary 15). This is analogous to feature amounts of model 104. The recognition targets depicted in Figure 15, word list 14 (e.g., first row in word list 14) are analogous to the ideographs depicted in Figure 14 (e.g., Trees). There is no need to divide the recognition target "Trees" into units for collation of recognition target "Trees" and candidate word "wood".

5. Applicants' arguments with regard to Claims 3, 4 and 7, as stated in Pages 11-14 of the instant amendment/remarks, are fully considered and they are persuasive. Consequently, the rejection of Claims 3, 4 and 7 are hereby expressly withdrawn.
6. Applicants' arguments with regard to Claims 2, 6 and 8 are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 10, 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Line 9 of Claim 10, "feature amounts of patterns" lacks antecedent basis.

In Lines 12 of claim 10, "the recognition candidate word" lacks antecedent basis.

In Line 9 of Claim 12, "feature amounts of patterns" lacks antecedent basis.

In Lines 12 of claim 12, "the recognition candidate word" lacks antecedent basis.

In Lines 11 and 12 of Claim 13, "the feature amounts of the candidate pattern string and the plurality of characters" are vague and indefinite. It is not clear whether "the feature amounts" also applies to "the plurality of characters" or does not. If the feature amounts belong to "the plurality of characters", there is lack of antecedent basis.

Claim Objections

9. Claims 6 and 7 are objected to because of the following informalities:

In Lines 4 and 5 of Claim 6, "the word" should be corrected to "the candidate word".

In Lines 2, 3 and 5 of Claim 7, "the word" should be corrected to "the candidate word".

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1 and 9-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Lyon (U.S. 5,675,665).

Regarding Claim 1, Lyon discloses a word recognizing apparatus, comprising:

a listing unit for storing a list of at least one candidate word comprising a plurality of characters (Figure 1, lexicon memory 30, word memory 32; Column 4, Lines 63-67; Figures 3, 4 and 11-16);

a dictionary unit storing feature amounts of a plurality of characters (Figures 1, 5-7 and 11-16, bounds measurement memory 36, bounds model memory 38; Column 10, Lines 39-67, Column 11, Lines 1-25. Based on the feature amounts extracted from the training word characters, feature amounts of plurality of model characters are extracted and stored in bounds model memory 38 as depicted in Figures 6 and 7.);

an extracting unit extracting a feature amount from a recognition target by a process in which the recognition target is not required to be divided into units even if the recognition target comprises a plurality of units (Figures 14-16; Column 20, Lines 34-62. Word recognition unit 22 generates a feature amount (Figure 3; word structure 60) for only a candidate word shown in Figure 14 (word or ideograph 300). The ideograph "Forest" in Figure 14 of the prior art comprises of three "one-character word". The

recognition process of ideograph "Forest" does not require dividing the ideograph into units because it only requires the feature amount of the one-character word "Tree".);

a generating unit referring to the list of at least one candidate word stored in said listing unit, and dynamically generating a feature amount of only a candidate word registered in the list by a composition operation using the feature amounts of characters stored in said dictionary unit during a recognition process for the recognition target (Figure 16; Column 21, Lines 3-28), the feature amounts of the word and characters and the composition operation determined such that the feature amount of the word generated by the composition operation matches a feature amount extracted from the word by said extracting unit (Figures 14-16; Column 20, Lines 34-67, Column 21, Lines 1-28. Feature amount of the word "Forest" is generated by the composition operation of integrating the feature amounts of characters "Wood". Figures 2, 5A-B, 6 and 7. Feature amounts of the word "feed" is generated by using feature amounts of plurality of characters "f ", "e " and "d ");

a collating unit collating the generated feature amount of the word with the feature amount extracted from the recognition target and outputting a recognition result (Figures 11-13; Column 20, Lines 63-67, Column 21, Lines 1-28. The feature amounts of a recognition target (e.g., Radical 300 meaning "wood") will be precisely compared with the feature amount of bound models 104 by bound evaluation unit 26.).

With regards to Claims 9-14, as best understood by the Examiner, arguments analogous to those presented for Claim 1 are applicable to Claims 9-14.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon (U.S. 5,675,665) in view of Brown et al (U.S. 5,875,256).

Regarding Claim 2, Lyon discloses the word recognizing apparatus according to Claim 1, wherein said collating means includes a memory means which stores the feature amounts of the word (Figure 1, bounds measurement memory 36, bounds model memory 38). Lyon et al does not explicitly disclose releasing the memory means when a collation of the feature amount of the word is completed, and storing a feature amount of the next word.

Releasing memory after completion of a predetermined process (e.g., comparison, recognition, etc.) is well known in the art as disclosed by Brown et al.

Brown et al disclose a handwritten recognition system comprising releasing memory when a collation of the extracted features of a word is completed, and storing a feature amount of the next word (Figure 7, Steps 702-709; Column 8, Lines 15-53).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teachings of Brown et al to incorporate releasing the memory location when a collation of the feature amount of the word is completed, and storing a feature amount of the next word in that location

because it is a well known procedure routinely implemented in the art to reduce memory requirement and increase the computation speed.

14. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon (U.S. 5,675,665) in view of Kim et al (A Lexicon Driven Approach to Handwritten Word Recognition for Real-Time Applications).

Lyon does not disclose further limitations of Claim 6.

Kim et al in the same field of handwritten word recognition that uses word models (as opposed to character models) disclose a handwritten word recognition system comprising generating unit that generates a new direction code histogram series by arranging a plurality of directions code histograms series corresponding to the feature amounts of characters composing the word and designates a generated direction code histogram series as the feature amount of the word (Figures 4, 7(a) and 7(b); Pages 370-373; Sections 3.3, 4 and 5).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teaching of Kim et al to extract a direction code histogram series obtained from a conversion result as the feature amount of the recognition target because it will increase both the accuracy and the speed of the character recognition system (Kim et al; Abstract). Obtaining more accurate information regarding the word structure will improve system reliability and will result in higher confidence level in word recognition.

Regarding Claim 8, Lyon further discloses the word recognizing apparatus according to Claim 1, wherein said listing unit stores a list which has a high possibility of containing a word corresponding to the recognition target (Column 4, Lines 46-61).

Lyon et al does not explicitly disclose selecting a list from among the plurality of lists according to a previous recognition result.

Kim et al disclose selecting a list which has a high possibility of containing words corresponding to the recognition target according to a previous recognition result (Page 375, Section 7.1, List of postal words).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teachings of KIM ET AL to select a list from among the plurality of lists according to a previous recognition result because it is a conventional procedure routinely implemented in probabilistic pattern recognition to incorporate most relevant and most credible reference patterns. This methodology will significantly reduce the time duration for word recognition.

Allowable Subject Matter

15. Claims 3, 4 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and rewritten to overcome the 35 U.S.C. 112, second paragraph rejection set forth in the Office Action.

Claim 3 of the instant invention recites the word recognizing apparatus according to Claim 1, further comprising extracting unit for performing a one-dimensional gradating conversion in a direction perpendicular to a connecting direction of characters for a

direction code histogram of a contour line in each of the plurality of small areas in an inputted image provided that no gradating conversion is performed in the connecting direction of the characters, and extracting a direction code histogram series obtained from a conversion result as the feature amount of the recognition target.

Claim 4 depends on Claim 3, and is therefore allowable.

Claim 7 of the instant invention recites the word recognizing apparatus according to Claim 1, wherein said collating unit performs a non-linear matching of the feature amount of the word and the feature amount of the recognition target, and calculates a degree of similarity between the feature amount of the word and feature amount of the recognition target.

Contact Information

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2623

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MEHRDAD DASTOURI
PRIMARY EXAMINER



Mehrdad Dastouri
Primary examiner
Art Unit 2623
March 3, 2004